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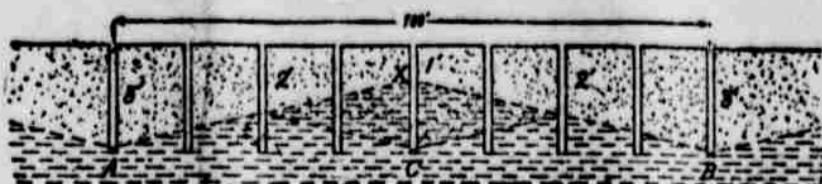
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TILE DRAINS IN CLAY SOIL



— = drained soil

— = undrained soil

— = soil undrained when drains are 100 feet apart, but
drained when they are 50 feet apart

The illustration shown herewith is from a bulletin of the Ontario Department of Agriculture and shows how the water table of the soil depends on the location of drains. If in a field that is underdrained three feet deep a number of holes are dug it would be observed after a heavy rain that in those nearest the drains no water would remain. In the hole situated half-way between the drains at C would hold considerable water for a few days.

In a clay in fairly good condition it will be found that the slope of the water table is about 1 foot in 25, in loam 1 foot in about 33. The illustration represents a clay soil with drains A and B 100 feet apart. Wells are dug 12.5 feet apart. At the end of 48 hours after a heavy rain the water will stand about as indicated by zig-zag lines, in a gradient of about 1 in 25, and hence will be two feet deeper in the centre well than at either drain. Hence if the drains are

three feet deep there will be three feet of drained soil over A and B, but only one foot at X. Capillarity and soil resistance to water flow play an important part in holding the water highest half way between the drains, and the gradient 1 in 25 represents their combined strength in clay, hence after this gradient is reached drainage becomes very, very slow, and the water table stands in this irregular shape until lowered by evaporation from the soil and plants. But during the months of April, May and sometimes June, when the rains supply at the surface all the water needed for evaporation, none is drawn from below for this purpose, hence during the early months of growth the water stands as indicated by the dotted line AXB. Consequently root development is hampered at X, as 1 foot of soil is not enough. There are two ways to remedy the defect, either to dig A and B deeper or else put a drain at C half way between.

MONTANA DRY FARM RESULTS

Conclusions as Arrived at After Six
Years' of Experimenting Are
Very Interesting.

For the past six years the Montana experiment station has been conducting experiments upon dry land, under the direct charge of Prof. Alfred Atkinson and Mr. J. B. Nelson, superintendent of dry farm work. The results are to be published in bulletin No. 83, and may be had upon application to the director of the experiment station. The conclusions drawn from this work are very interesting and are as follows:

1. That the precipitation during the six years, 1905-10, was very close to the normal precipitation as shown by all of the available records of the U. S. weather bureau. This applies to the total amount as well as to the distribution of the rainfall over the growing season.

2. That, of all crops raised, potatoes, with an average yield of 165.32 bushels per acre, and returning an average net profit of \$41.99, are the most profitable. Of the grain crops, fall sown or winter wheat gives the best returns. Kharkov, an improved Turkey Red, gave an average yield of 40.41 bushels and an average net profit of \$21.30 per acre. This was grown at the Fergus county station only. The Turkey Red, which was grown all years and at all stations, gave an average yield of 32.45 bushels, with an average net profit of \$14.49 per acre. Among the spring-planted grains, corn, Hanna barley, sixty-day oats and flax, in the order named, were the most profitable; while alfalfa and fodder corn were the most satisfactory forage crops.

3. That it is decidedly more profitable to raise grain crops under a system of alternate cropping and fallowing, or summer tillage, than to raise them continuously.

4. That the first crop will be more profitable if breaking is done the year previous than if the crop is planted the same spring, immediately after breaking.

5. That more profitable crops are raised where the fallow is summer tilled than where it is allowed to lie untouched through the summer.

6. That it makes no practical difference in the yield of grain whether fall plowing or spring plowing is practiced in the preparation of the preceding fallow.

7. That on the average five pecks of seed is the best amount to use in seeding dry land grain crops.

8. That there is positive loss from lessened yield where fall sown crops are fallowed in the spring.

9. That grains planted in the ordinary way, with a seed drill, give larger yields than grains planted in rows 24 inches apart and intertilled during growth.

CULTIVATION OF DRY CROPS

Main Thing is to See That Plants
Have Good Roots—No Tearing
Out If Done Properly.

Professor Blount was recently quoted as advocating the advantage of cultivating grain crops in the arid regions and being laughed at by some who could not understand the philosophy of such a proposition. Professor Blount is absolutely right as I have proved by experience. Last season at Cheyenne was one of the driest on record and all crops grown on the state dry farm under my supervision were cultivated several times after they were up and had good roots—some when knee high to the team, writes Dr. V. T. Cooke in the Denver Field and Farm. The object of cultivating with the crop as high as this was more to show that such cultivation although possibly not beneficial at least did no harm.

The crops cultivated were winter wheat and winter rye in the spring. Then in due time we also cultivated spring wheat, oats, barley, emmer or speltas, Canadian field peas, stock beets, corn, millet, sorghum and potatoes. A twelve-foot three-row spring-tooth riding weeder with a lever was used. This lever enables the driver to control the depth of cultivation. A common steel drag harrow will take the place of a weeder as a cultivator provided the teeth are sharp and set slantingly. Judgment must be used on some soils as to how early this work should be begun. One can get onto the crop too soon and thus tear out considerable of the growing grain, which is entirely unnecessary.

The main thing is to see that the crops have good roots and if the work is properly done, very little if any tearing out will occur, but the work will surely get rid of thousands of weeds, as well as stimulate the crop, besides making the soil in better condition to conserve and receive moisture. We know the cultivation of corn is necessary and pays. Then why not cultivate cereals? In fact all crops grown in arid and semiarid countries should be cultivated. Due consideration should be given the grain crop in an abnormally wet season, for cultivation under these conditions is not so extremely essential.

A great deal more importance should be attached to this cultivation than there is. The weeder gives the farmer a greater margin of time to do this work because it enables him to get onto taller grain and he can control the depth he wishes to cultivate. The weeder is of light draft and a fast team can cover a considerable area in a day. The common steel drag harrow can be used and is very effective in heavier soils.

Good words cost nothing, but are worth much.

LIVE STOCK NOTES.

The period of gestation in sheep is 152 days.

Keep the pigs growing right into the market.

Winter sunshine counts for much in the hog house.

Salt in some quantity is a necessity to living animals.

The best profits in hog raising are always quick profits.

Select the breeders from large litters farrowed by mature sows.

The hogs like good pasture but they need a little grain, too.

Water is cheap, but it is very essential in good feeding.

Hogs can be raised at a profit, and farmers should raise more of them.

Raw eggs with the shells crushed finely are good for scours in calves.

Every farm of 80 acres and up ought to have a small flock of sheep.

Rape makes a good pasture if sown frequently. A little rye mixed in helps.

Keeping the hogs in clean surroundings is the best preventive of disease.

The mares with their colts double in value every year, with no extra expense, except fees for breeding.

Market some of the older sheep, and retain part of the choice lambs for the improvement of your own flock.

Make a feeding platform for the hogs eight inches high with a two-inch protecting board all around to keep the feed out of the winter's mud.

Never get the idea in your heads that breeding from young and immature breeding stock encourages early maturity in the progeny, for it is a mistake.

Pumpkin feeding has been tried in the crate feeding work at the University of Maine, but it has not been found satisfactory if one attempts to attend for three weeks only.

Weights Horses Should Carry.

At the Paris horse show recently a special jury of experts was appointed to determine just how much a horse of a given weight should carry in the saddle. The jury brought in the following decision: A horse weighing not more than 825 pounds should not carry a greater weight than 187 pounds, provided the girth of the animal does not exceed 67 inches. A horse weighing 935 pounds or less, with a girth of 69 inches, should not carry more than 209 pounds, and a horse weighing 1,045 pounds, with a girth of 71 inches, should not carry more than 231 pounds.

English Farmer's Plan.

An English farmer who has had great success with hogs, builds his houses with a section of the wall hung on a swivel pin in the middle, which can be swung open whenever sunlight and air are needed. When the section is released, it swings back into an upright position by gravitation.

Farm Profits.

If anything will show a dollar profit on a farm it is cows. The more cows the more hay and fodder can be raised and the more fodder we cut the more cows can be kept. Many of the farmers who gave up cows and went into potato growing a few years ago are coming back to cow keeping.

Horses for Food.

In Holland, as in other parts of Europe, horses are used for food. The retail price of horse meat is about six cents a pound—one-fourth the price of similar cuts of beef.

Some Big Crop Stories.

Apples 11 inches in circumference are among those produced by E. F. Stevens, the orchardist of Crete, Neb. J. Martin, of Gibbald, Ia., raised on his farm a water melon which weighed 95 pounds. It supplied a feast for 100 persons more or less.

Doctor Swain, of Moundsville, W. Va., boasts of a tomato weighing 3½ pounds which grew on a vine 8 feet long.

J. W. Long of Eaton, Ind., raised beans the pods of which measured some 36 to 38 inches in length. The editor of the local paper described them as "a rare variety."

Profitable Frog Farms.

There are a few frog farms scattered throughout the United States which are profitable to their owners. The ponds are fenced with wire and roofed over with the same to keep out the birds and animals which prey upon the small frogs. There is an increasing demand in all the big markets for this delicacy.